

Canadian ILWS Update

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International
Living With
a Star



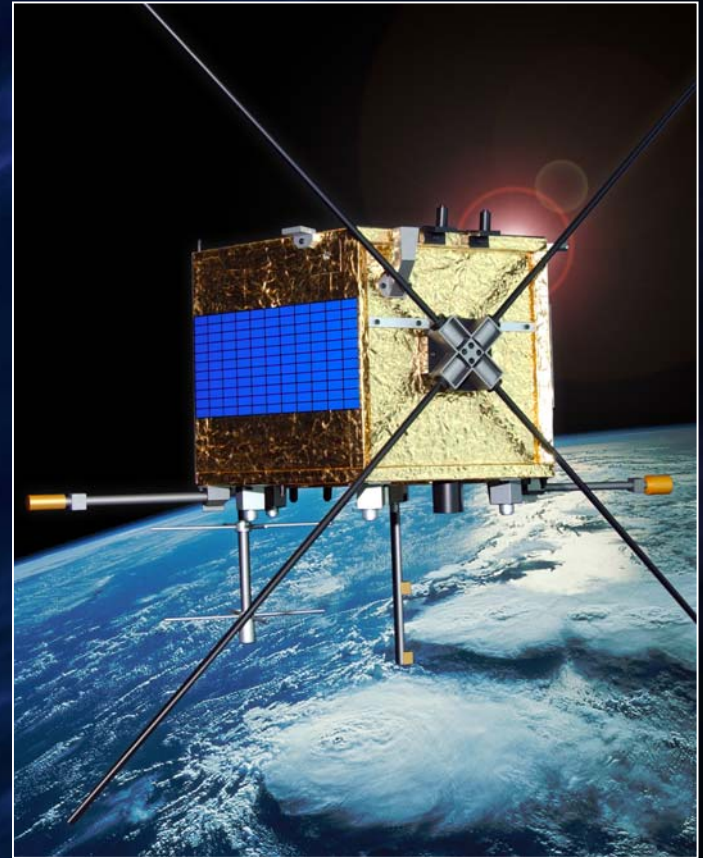
Overall Comments

- The Canadian community has seized the ILWS initiative and created a number of opportunities which would otherwise not have existed.
- Even in a comparably favorable environment, promoting solar-terrestrial physics has been a difficult track



ePOP/CASSIOPE

- Acceleration of charged particles and associated loss
- Potential neutral loss due to charge-exchange
- Auroral processes
- Ionospheric wave propagation and tomography
- CASCADE payload provides downlink bandwidth 30x greater than before



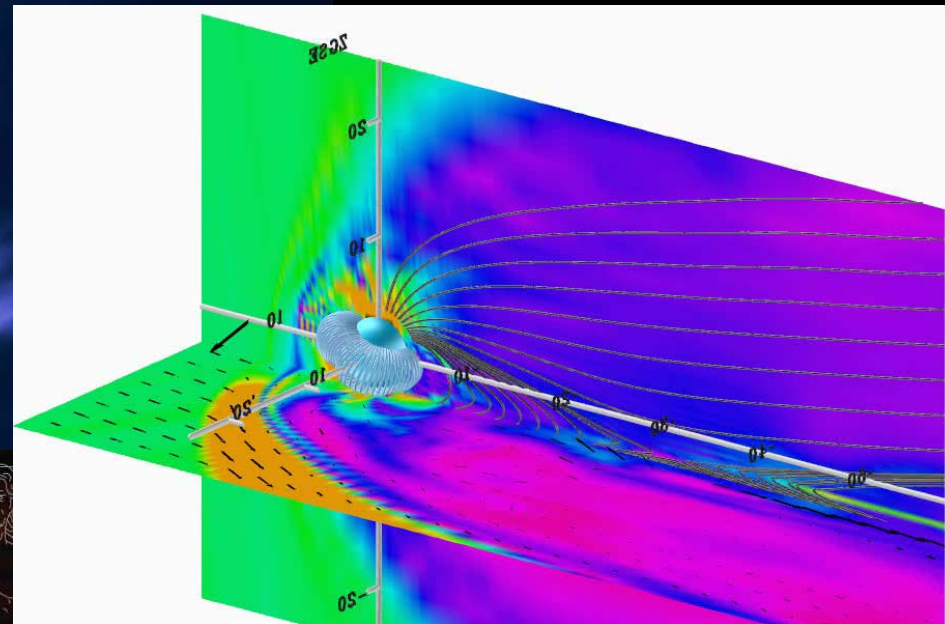
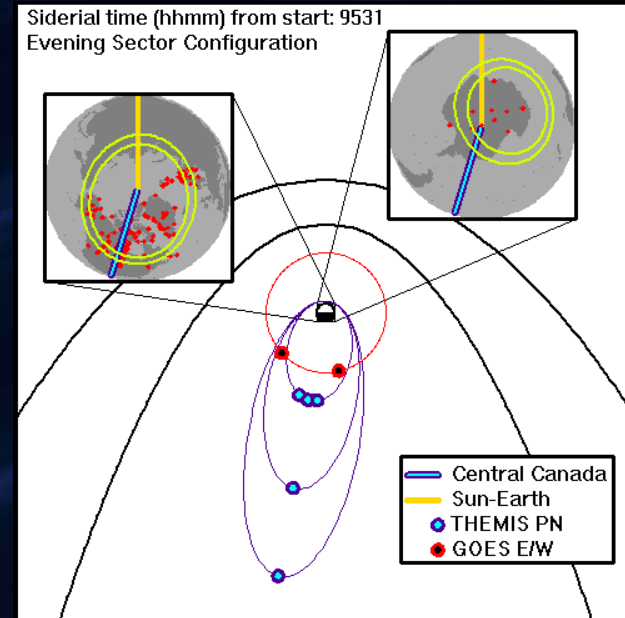
SWARM cEFI

- The first full Canadian instrument to fly on an ESA mission
- The first Canadian instrument to fly in a constellation
- The most recent success story of Canada's sounding rocket program
 - cEFI was prototyped under three sounding rocket flights (GEODESIC, CUSP2002, and JOULE)



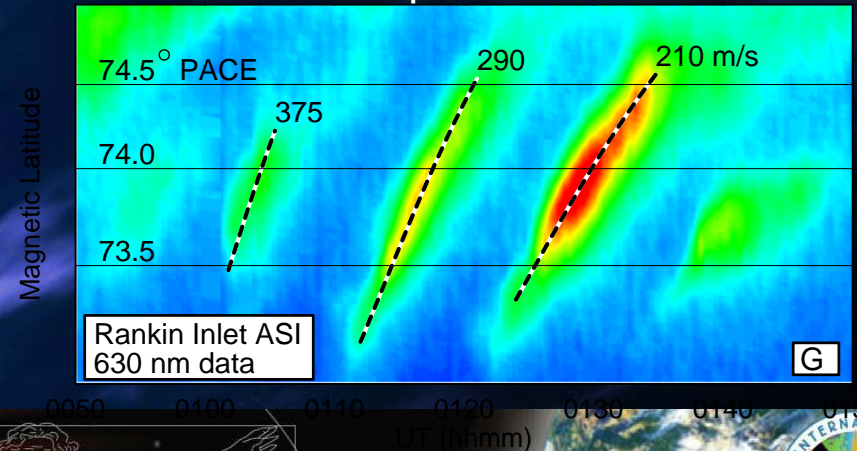
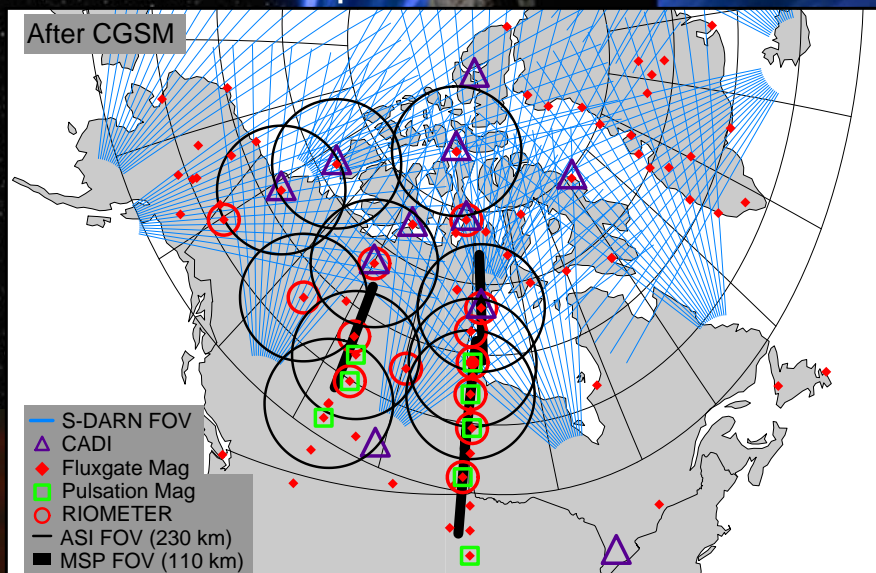
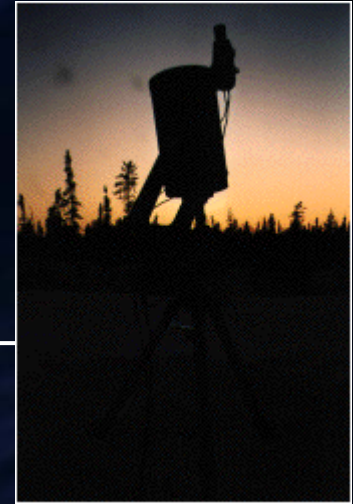
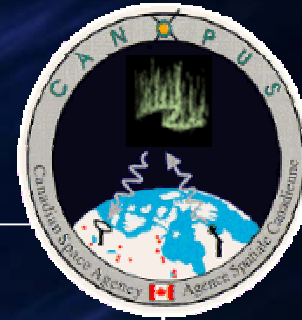
THEMIS

- Five NASA s/c aligning at the nightside Canadian sector every 4 days to determine the sequence of events in the substorm
- Canada responsible for operating the ground-based THEMIS network to establish the geophysical context of the events and geo-effect timing



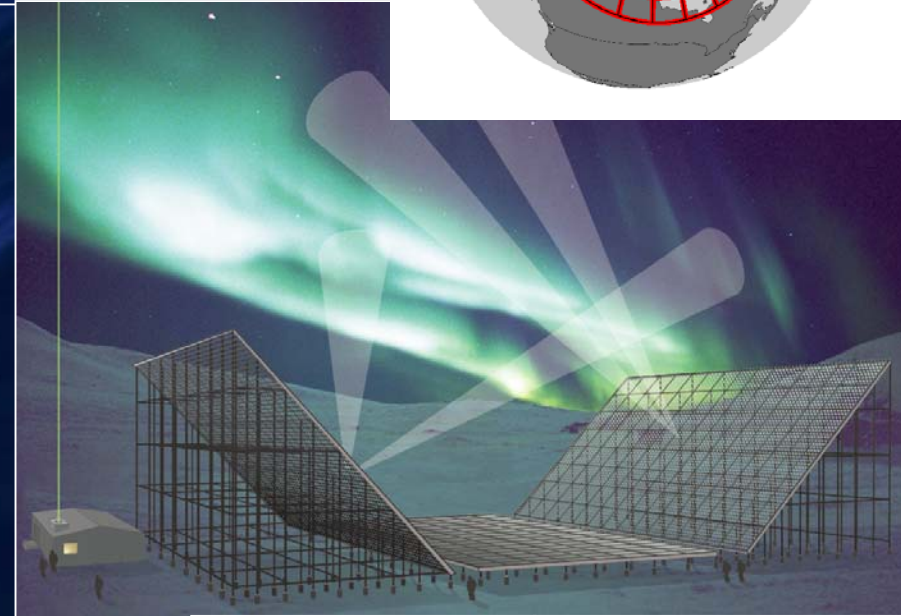
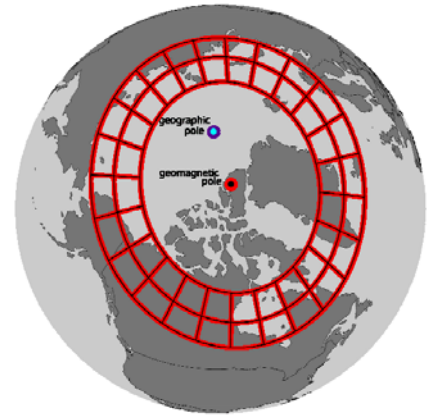
CGSM

- CSA's CANOPUS has led to
 - CGSM which is 4 times larger
 - new instrumentation
 - better quantitative science



AMISR and IPY

- US National Science Foundation
 - \$44 M Advanced Modular Incoherent Scatter Radar, 2 of 3 faces in Resolute
 - \$100 M Distributed Array of Small Instrument (DASI), under discussion
- CSA
 - Unparalleled experience in science instrument operation in the North (CGSM and THEMIS C)
- Canadian IPY
 - No funding in the last budget
 - Continue the push (A science component in the Northern Strategy)
 - THEMIS-C, AMISR, and CGSM cooperation with IPY Secretariat in planning



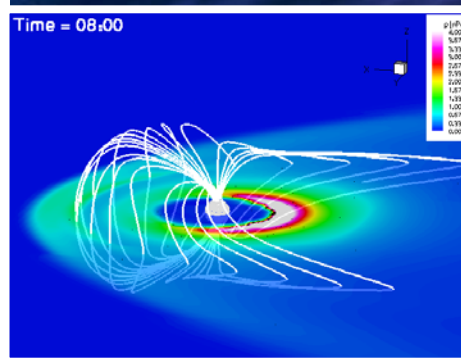
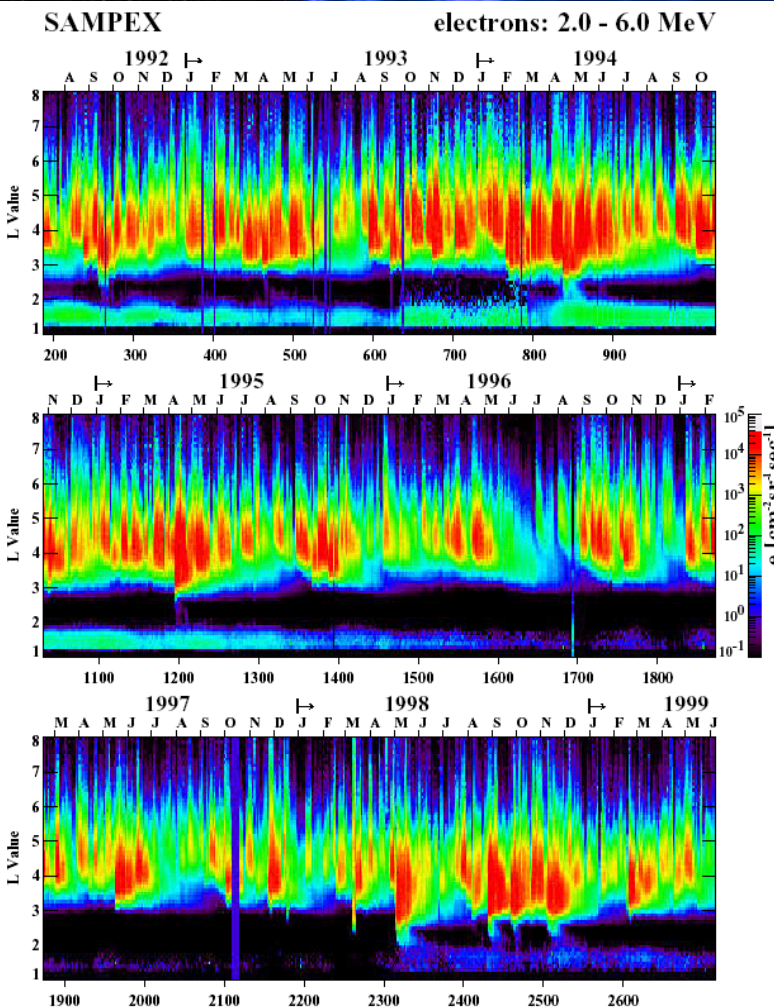
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ORBITALS

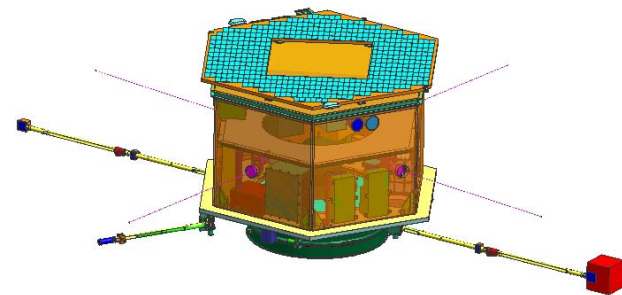
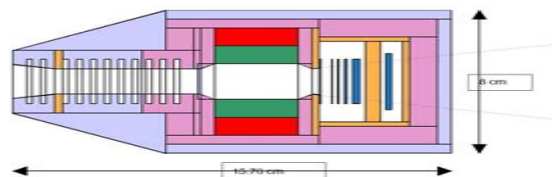
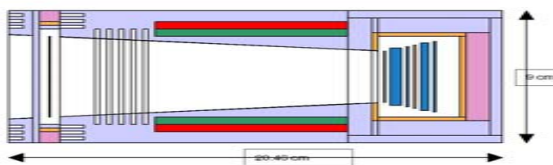


- A smallsat radiation-belt explorer (first since 1991)
- Will study the radiation belt dynamics from seconds to years
- Will update radiation-belt specification models for s/c engineering



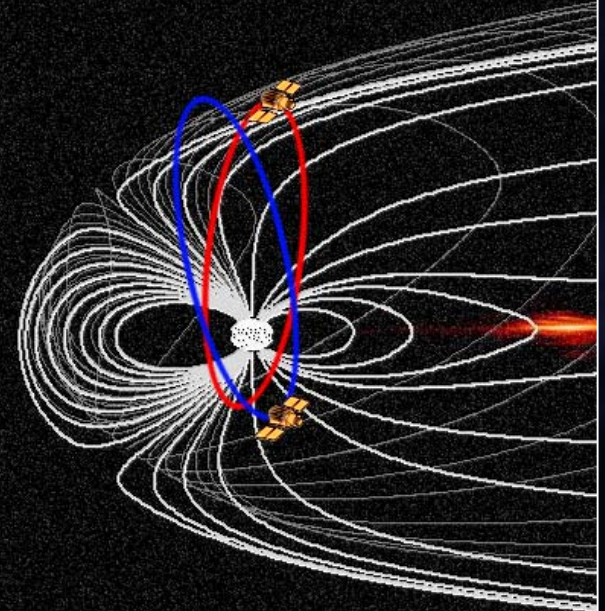
ORBITALS

- Mission can be accommodated on CSA Smallsat bus, with manageable challenges and risk
- Would trigger new instrument development (e.g., HEPT by Professor Fedojesevs, NSERC Sr IRC)
- Would have a strong international participation (three instruments are US baseline – negotiating with NASA)
- Would be Canada's first HEO/GTO science mission

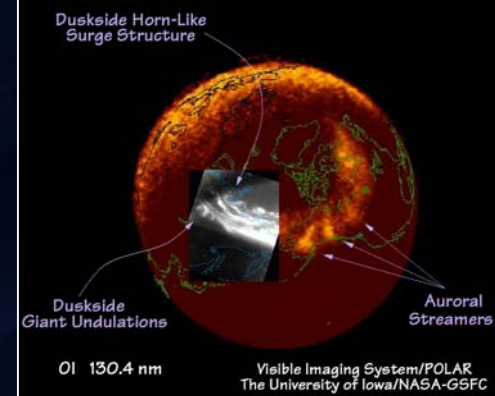


Ravens

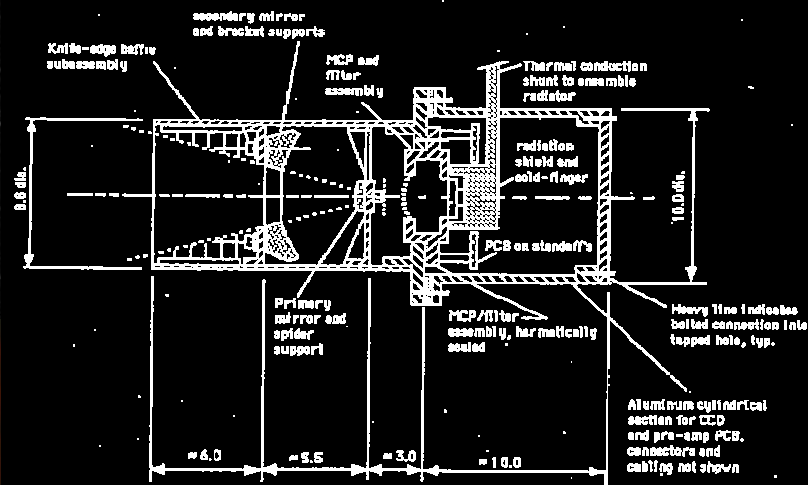
- Is a CSA Concept Study now merged with the Kuaifu mission Phase A study in China
- Ravens consists of two contraposed polar HEO satellites carrying a suite of imagers for 24/7 imaging of auroral borealis
- Other int'l partners in the consortium include Germany, Belgium, UK, and Finland.



Ravens

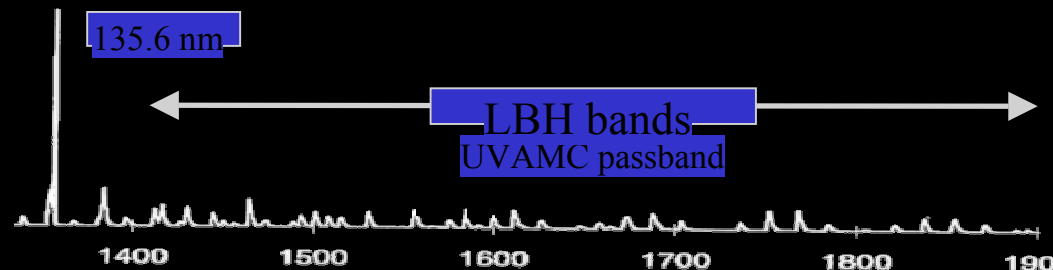


- Mission would be flown on Chinese satellites and launchers (CGP issues to be resolved)
- Would trigger new instrument development (autocomparative auroral imager)
- Would take global auroral imaging to the quantitative era



a
130.4 nm

FUV Auroral Spectrum



Conclusions

- ILWS has a very positive influence and strong following in Canada
- Several ongoing and potential projects
- International environment and collaboration will determine whether ambitious potential projects (e.g., ORBITALS) will materialize

